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U S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NO.
WELCKER-1 (PCT)

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)
09/744820

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/DE99/02323	30 JULY 1999	1 AUGUST 1998

TITLE OF INVENTION
BATTERY TERMINAL CONNECTION CABLE

JC06 Rec'd PCT/PTO 30 JAN 2001

APPLICANT(S) FOR DO/EO/US
FRIEDRICH WELCKER

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. X This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ___ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. X This is an express request to begin national examination procedures (35 U.S.C. 371 (f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(l).
4. X A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. X A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. X is transmitted herewith (required only if not transmitted by the International Bureau)
   b. ___ has been transmitted by the International Bureau.
   c. ___ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. X A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ___ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).
   a. ___ are transmitted herewith (required only if not transmitted by the International Bureau).
   b. ___ have been transmitted by the International Bureau.
   c. ___ have not been made; however, the time limit for making such amendments has **NOT** expired.
   d. ___ have not been made and will not be made.
8. ___ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. X An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ___ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. X An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ___ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. X A **FIRST** preliminary amendment.
    ___ A **SECOND** or **SUBSEQUENT** preliminary amendment.
14. ___ A substitute specification.
15. ___ A change of power of attorney and/or address letter.
16. X Other items or information:

    PCT/ISA/210 - Int'l. Search Report (English)
    3 Sheets of Formal Drawings

09/7 44820
JC07 Rec'd PCT/PTO 30 JAN 2001

APPLICATION NO. (if known, see 37 CFR 1.5)	INTERNATIONAL APPLICATION NO PCT/DE99/02323	ATTORNEY'S DOCKET NO. WELCKER-1 (PCT)
X The following fees are submitted:	CALCULATIONS	PTO USE ONLY
Basic National Fee (37 CFR 1.492(a)(1)-(5)):		
Search Report has been prepared by the EPO or JPO.....**$860.00**		
International preliminary examination fee paid to USPTO (37 CFR 1.482) **$690.00**		
Neither international preliminary examination fee paid (37 CFR 1.82) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO.....**$1,000.00**		
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4).....**$100.00**		
ENTER APPROPRIATE BASIC FEE AMOUNT =	$ 860.00	
Surcharge of **$130.00** for furnishing the oath or declaration later than ___ 20 ___ 30 months from the earliest claimed priority date (37 CFR 1.492(e)).		

Claims	Number Filed	Number Extra	Rate		
Total Claims	8 - 20 =	- 0 -	X **$18.00**	$	
Independent Claims	1 - 3 =	- 0 -	X **$80.00**	$	
Multiple dependent claim(s) (if applicable)			+ **$270.00**	$	
TOTAL OF ABOVE CALCULATIONS =				$ 860.00	
Reduction by 1/2 for Small Entity status.				$ 430.00	
SUBTOTAL =				$ ~~860.00~~ 430.00	
Processing fee of **$130.00** for furnishing the English translation later than ___ 20 ___ 30 months from the earliest claimed priority date (37 CFR 1.492(f)). +				$	
TOTAL NATIONAL FEE =				$ 430.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property +					
TOTAL FEES ENCLOSED =				$ 430.00	
				Amount to be: refunded	$
				charged	$

X Applicant claims Small Entity status.

a. X A check in the amount of $ 430.00 to cover the above fees is enclosed.

b. ___ Please charge my Deposit Account No. 03-2468 in the amount of $_____ to cover the above fees. A duplicate copy of this sheet is enclosed.

c. X The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment, to Deposit Account No. 03-2468. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:
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Edward R. Freedman
Signature

Edward R. Freedman
Reg. No. 26,048

Express Mail No. EL 622 000 057 US
Date of Deposit January 30, 2001

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10, on the date indicated above, and is addressed to the Ass't. Commissioner for Patents, Washington, D.C. 20231

Lisa L. Vulpis
Lisa L. Vulpis

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: FRIEDRICH WELCKER - 1 (PCT)

PCT NO.: PCT/DE99/02323

FILED: JULY 30, 1999

TITLE: BATTERY TERMINAL CONNECTING CABLE

PRELIMINARY AMENDMENT

BOX PCT
Ass't. Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

Preliminary to the initial Office Action, please amend the above-identified application as follows:

IN THE ABSTRACT:

Please add the attached Abstract of the Disclosure on a separate page.

IN THE SPECIFICATION:

PLEASE DISREGARD THE NUMBERING ON THE LEFT MARGIN THROUGHOUT.

Page 1, delete lines 1-6 (the first full paragraph) and insert the following paragraph:

--The invention relates to a battery terminal connecting cable with a strand consisting of numerous fine wires and a

further section having a hole for a screw, whereby on the further section the numerous fine wires are welded together, a method for the manufacture of a battery terminal connecting cable and a device for the manufacture of such a cable.--

Page 2, delete lines 14-22 and insert the following paragraphs:

--A battery terminal connecting cable of appropriate type is known from EP-A-O 707 321. In practice the end of the cable strand produced by spot welding does not give the required strength values for the cable end so that the cables described have not proved suitable as battery terminal cables.

US 4,325,760 discloses a cable whose end was soldered. However, soldering is an expensive procedure which leads to increased costs in the area of mass production.

The invention is based on the problem of preparing a connection between battery terminal connecting cable and battery terminal at a favourable cost, which ensures secure contact between the battery terminal connecting cable and the battery terminal even under severe vibration or thermal expansion.

The problem is solved using a battery terminal connecting cable of appropriate type where the strand is at least partly

insulated and a further section is secured at the end of the strand.--

Page 3, delete lines 10-13;

lines 15-16, delete ", or a connecting piece made of solid material, are" and insert --is--;

line 23, delete "It is advantageous if" and insert --According to the invention--;

line 26, delete "with" and insert --to--;

line 28, delete "advantageous" and insert --preferred--;

line 30, delete "on at" and insert --onto--; change "Thus a particularly" to --In this way a specially--;

lines 31-32, delete "In particular, this" and insert --This in particular--.

Page 4, last line, after "ultrasound" insert --and the strand is welded to a contact piece or with a contact piece.

The use of ultrasound for making electrical connections is already known from EP-A-0 671 790. However, the welding of the strand to a contact piece or with a contact piece cannot be inferred from this document.--

Page 5, delete lines 13-14;

line 20, after "device." insert --According to the invention, movable jaws act on the strand at right angles to the axis of the pressure cylinder.--;

line 25, delete "should preferably be" and insert --are--.

IN THE CLAIMS:

Please cancel claims 1-11 and replace them with new claims 12-19 as follows:

--12. A battery terminal connecting cable (1) with a strand (2) consisting of numerous fine wires and a further section (4, 5) having a hole for a screw whereby on the further section (4, 5) the numerous fine wires are welded together, characterised in that the strand (2) is at least partly insulated and the further section (4, 5) is secured at the end of the strand (2) and has a contact piece to attach the strand to the battery terminal.

13. The battery terminal connecting cable according to Claim 12, characterised in that the further section (4, 5) is welded at the end of the strand (2).

14. The battery terminal cable according Claim 12, characterised in that the further section (4, 5) has a contact piece (6, 7) to attach the strand (2) to the battery terminal.

15. The battery terminal connecting cable according to Claim 12, characterised in that the further section (4, 5) is made of copper.

16. The battery terminal connecting cable according to Claim 12, characterised in that the further section (4, 5) is configured so that its longitudinal extension (22) runs at an angle to the longitudinal axis (23) of the cable (1).

17. A method for the manufacture of a battery terminal connecting cable (1) according to Claim 12, in which a strand (2) consisting of numerous fine wires is welded by means of ultrasound, characterised in that the strand (2) is welded to a contact piece or with a contact piece (6, 7).

18. The method according to Claim 17, characterised in that the strand (2) is brought flat in contact with the contact piece (6, 7) and then welded with the contact piece (6, 7) under pressure.

19. A device for the manufacture of a battery terminal connecting cable (1) according to Claim 12, using a sonotrode (17), a strand feed device, a contact piece feed device and a pressure cylinder (18) arranged so that the strand (2) and the contact piece (7) can be pressed onto each other by this means,

characterised by movable jaws which act on the strand (2) at right angles to the axis of the pressure cylinder (18).--

REMARKS

By this Preliminary Amendment, a discussion of prior art references has been inserted on page 2 and other minor amendments have been made in the specification. Claims 1-11 have been replaced by new claims 12-19 and an Abstract is being provided. These changes correspond with the changes made in the International application. No new matter has been introduced. Entry of this amendment is respectfully requested.

Respectfully submitted,
FRIEDRICH WELCKER - 1 (PCT)

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Enclosure: Abstract

Express Mail No. **EL 622 000 057 US**
Date of Deposit January 30, 2001

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10, on the date indicated above, and is addressed to the Ass't. Commissioner for Patents, Washington, D.C. 20231

Lisa L. Vulpis
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Battery terminal connecting cable

The invention relates to a battery terminal connecting cable with a strand consisting of numerous fine wires which is at least partially insulated, and a further section having a hole for a screw, a method for the manufacture of a battery terminal connecting cable and a device for the manufacture of such a cable.

Battery terminal connecting cables are used primarily to interconnect battery cells conductively. In this case one also talks of cell connectors. For the conduction of relatively high currents at low electrical resistance the strand usually consists of copper wires twisted into a strand having a cross-section of approximately 50 mm^2. Depending on the field of application, however, both thicker and thinner strands are used.

In order to connect such a strand consisting of numerous fine copper wires to a battery terminal, a copper pipe section is first inverted over the strand and this pipe section is then pressed to an approximate plate shape. In this plate there is a hole which first passes through the upper side of the original pipe section, then through the compressed cable and finally through the lower side of the original pipe section. Finally in this hole there is inserted a screw which interacts with a thread in the battery terminal so that when the screw is tightened, the strand held together by means of the copper sleeving is pressed onto the battery terminal.

In practice it has been found that even a relatively strongly tightened screw works loose as a result of vibrations, as occur especially in batteries located in vehicles. This has the result that the end of the cable is no longer securely connected to the battery terminal. Contact is therefore made over smaller areas and is thus

severely impaired. In cases of more severe loosening this leads to undesirable heating, even to the extent of sparking.

In order to prevent screws working loose, in known battery terminals a plastic section, such as preferably a plastic bead, is provided in the thread region between the screw and the battery terminal. This bead becomes deformed as the screw is turned and acts to prevent loosening of the screw.

The insertion of a bead or other plastic section has the result that expensive, special screws are required. Since battery terminal connectors are a mass-produced product manufactured in large quantities, any increase in the cost of the product leads to economic disadvantages.

The problem for the invention is thus to prepare a connection between battery terminal connecting cable and battery terminal at a favourable cost which ensures that the battery terminal connecting cable fits tightly on the battery terminal even under severe vibration or thermal expansion.

The problem is solved by means of a battery terminal connecting cable in which at least at one end of the strand numerous fine wires are welded together.

The invention is based on the knowledge that the problem of screw loosening in the battery terminal is not primarily attributable to the screw being held inadequately in the battery terminal. The reason for loosening screws lies in the fact that at times fairly high temperatures occur at the contact piece of the battery terminal connecting cable as a result of the flowing currents. At varying temperatures the fine wires inside the copper sleeving are severely compressed from time to time and then remain in this severely compressed form. As a result after many temperature

fluctuations the originally tightened screw is subject to less force, so that the screw sits more loosely in the thread. Loosening of the screw can then only be impeded by the plastic section described above. The plastic section certainly impedes loosening of the screw but the fact that the screw at times exerts less pressure on the contact piece is not impeded by the plastic section. However, a constant pressure on the contact piece is required to ensure a continuous equally good current flow.

Since the invention proposes that numerous fine wires should be welded together at the end of the strand, either the weld region can be used as a solid contact piece or a contact piece consisting of solid material can be welded on.

Practical tests have shown that when a cable end consisting of wires welded together, or a connecting piece made of solid material, are screwed on, the compression of the connecting piece described above does not occur and consequently normal screws without protection against loosening can be used. Since the screw now presses the contact piece onto the battery terminal at a constant pressure, optimal electrical conditions are created and thus the heating in the contact region is reduced.

It is advantageous if a further section is secured at the end of the strand. This further section can, for example, serve as a contact piece and can be connected in various ways with the end of the strand welded to form a solid material.

A particularly advantageous embodiment of a battery terminal connecting cable is obtained if the further section is welded on at the end of the strand. Thus a particularly favourably shaped contact piece can be used. In particular, this allows the weight of the battery terminal connecting cable to be reduced.

It is also advantageous if the further section, preferably constructed as a contact piece, is made of copper.

In all known battery terminal connecting cables the longitudinal axis of the further section extends in the direction of the axis of the battery terminal connecting cable. Since the battery terminal connecting cable serves as a connecting element between two terminals, it seems to be logical to use a further section extending in the direction of the axis of the battery terminal connecting cable. However, tests have shown that in many cases it is of great advantage if this further section is configured such that its longitudinal extension runs at an angle to the longitudinal axis of the cable. Examples of this type of configuration are shown in Figs. 6 - 9.

Depending on the configuration of the battery terminals, in practice the connecting cables are frequently very severely bent. In many cases, the angular configuration of the further section to the axis of the battery terminal connecting cable reduces the necessary bending of the cable and also allows shorter cables to be used. The configuration described thus has the result that the cable can be protected and material usage can be reduced.

The angular configuration described is also of great importance for battery terminal connecting cables regardless of the afore-mentioned characteristics and can thus also be used to advantage for clamp connections between the cable strand and a further section.

The problem according to the invention is also solved using a method for the manufacture of a battery terminal connecting cable in which a strand consisting of numerous fine wires is welded by means of ultrasound.

All types of welding or soldering of an end of a strand developed so far have failed in that the high heat input during the welding process is transferred from the copper cables normally used to the insulating layer. On the one hand, this leads to destruction of the insulation and on the other, the input heat is rapidly dissipated. Only welding by means of ultrasound produced such good results that the insulating layer can remain on the cable strand during welding. This surprising result reduces the energy input and allows known manufacturing methods for moulding plastic onto the connecting regions to be used even for the new battery terminal connecting cable.

The strand is preferably welded to a contact piece or with a contact piece.

For manufacture of the battery terminal connecting cable according to the invention a device is proposed which has a sonotrode, a strand feed device, a contact piece feed device and a pressure cylinder arranged so that the strand and the contact piece can be pressed onto one another by means of this device.

The device allows the battery terminal connecting cable to be manufactured automatically and rapidly.

Since during pressing of the wire strand the fine wires are pressed to the side, it is proposed that on the device according to the invention there should preferably be provided movable jaws which act on the strand at right angles to the axis of the pressure cylinder. These jaws together with the pressure cylinder and the sonotrode define a cross-section in which the wires should be welded together to form the most compact copper piece. At the end of the welding process the jaws are moved away from the strand and the pressure cylinder is retracted so that the strand

connected to the contact piece can be removed from the device.

An example of embodiment according to the invention is show in the drawing and will be explained in greater detail in the following.

Figure 1 is a side view of a battery terminal connecting cable without plastic sleeving,

Figure 2 is a top view of the battery terminal connecting cable as in Fig. 1

Figure 3 is a section through one end of a battery terminal connecting cable with plastic sleeving,

Figure 4 is a schematic side view of a device for manufacturing a battery terminal connecting cable

Figure 5 is a schematic top view of the device as in Fig. 4,

Figure 6 is a top view of a battery terminal connecting cable with a further section at right angles to the cable axis,

Figure 7 is a schematic of the battery terminal connecting cable as in Fig. 6 in a curved embodiment,

Figure 8 is a first variant of a further section configured at an angle of approximately 45° and

Figure 9 is a second variant of a further section configured at an angle of approximately 45°.

The battery terminal connecting cable 1 shown in Figures 1 and 2 essentially consists of a strand 2 comprising numerous

fine wires surrounded in a central region by some insulation 3. At both ends the strand 2 is pressed together to form a flattened end 4 or 5. At this flattened end there is welded a contact piece 6 or 7. The contact pieces 6 or 7 exhibit a region 8 or 9 of reduced thickness where the flattened part 4 or 5 of the strand 2 is welded on by means of an ultrasound welding method. The reduced-thickness section 8 of the contact piece 6 is followed by a somewhat thicker region 10 or 11 having a central hole 12 or 13. The holes 12 or 13 are used to secure the contact piece to a battery terminal (not shown) via a screw (not shown) inserted in the hole.

The regions 4 or 5 of the strand 2 are at least partially relatively homogeneous as a result of the welding process since the numerous fine wires in this region are fused to form a solid metal piece. In the present case the wires and the contact piece are made of copper. However, the contact piece in particular can also be made of brass.

Then, as shown in Fig. 3, the ends of the battery terminal connecting cable thus prepared have an insulating material 14 moulded on by a known method. The strand 2 and more especially its ends 5 are thereby completely surrounded with insulating material. On the upper side 15 of the contact piece 7 there is provided a contact surface for the screw head (not shown) and on the lower side (16) of the contact piece 7 there is provided a contact surface for fitting the contact piece 9 to a battery terminal (not shown).

In order to manufacture the battery terminal connecting cable the end 5 of the strand 2 of numerous fine wires is placed on a titanium sonotrode 17 and the contact piece 7 is positioned on top of this such that the end 5 is adjacent to the narrower region 9 of the contact piece 7. Then a cylinder 18 is pressed towards the sonotrode 17 under pressure so that the narrower end 9 of the contact piece 7

and the end 5 of the strand of fine wires are pressed together between the cylinder 18 and the sonotrode 17. During the pressing process on the one hand, the fine wires of the end 5 are welded together by means of the sonotrode and on the other hand, they are welded simultaneously to the contact piece.

The top view of the entire device 19 shown in Figure 5 shows the movable jaws 20 and 21 which are moved towards the strand 2 before the contact piece 7 and the strand 2 are pressed together so that when the wires are pressed together by means of the pressure cylinder 18 the individual wires cannot be deflected sideways. In order to achieve optimum contact between the wires of the strand 2 and the contact piece 7, the shape of the jaws 21 and 22 is matched to the shape of the narrower end 9 of the contact piece 7.

The entire work process can easily be automated, as shown in the aforesaid embodiments, by guiding the strand 2 with a strand feed device (not shown) and the contact piece 7 with a contact piece feed device (not shown) towards the sonotrode 17 and then holding them there by means of the jaws 20 and 21 and the cylinder 18 whilst the sonotrode 17 welds the wires of the strand 2 with the contact piece 7. Then the holding devices 18, 20 and 21 are loosened, the ready welded battery terminal connecting cable is removed and the next sections are fed in. The ends of the removed battery terminal connecting cable are then surrounded with an insulating layer 14, as shown in Fig. 3.

The method described can be used for the fast and automated manufacture of battery terminal connecting cables and improves the quality of the cables because the homogeneous binding of the individual wires together prevents any loosening of the battery terminal screw used. More accurate calculations also allow the quantity of metal used, more especially the quantity of copper used to be reduced.

Figures 6 to 9 show various variants of the configuration of the contact piece 7 on the cable strand 2. The further section 4 together with the contact piece 7 has a longitudinal extension in the direction of the axis 22 which in the present case runs at an angle of 90° to the longitudinal axis 23 of the cable strand 2.

More especially, if the cable strand 2 is bent as shown in Fig. 7 or in the opposite direction, particularly favourable possibilities are obtained for the connection of two battery terminals.

Figures 8 and 9 show two different possibilities for welding the individual cables to the contact piece at an angle. Whereas in Fig. 8 the strand end 2 is bent in the direction of the profile of the contact piece 7, in the example of embodiment in Fig. 9 the wires of the strand 2 run in the direction of the axis 23 of the strand 2 and thus at an angle to the longitudinal axis 22 of the contact piece 7.

CLAIMS

1. A battery terminal connecting cable (1) with a strand (2) consisting of numerous fine wires which is at least partially insulated, and a further section (4, 5) having a hole for a screw, *characterised in that* on the further section (4, 5) the numerous fine wires are welded together.

2. The battery terminal connecting cable according to Claim 1, *characterised in that* the further section (4, 5) is secured at the end of the strand (2).

3. The battery terminal connecting cable according to Claim 2, *characterised in that* the further section (4, 5) is welded onto the end of the strand (2).

4. The battery terminal cable according to one of Claims 2 or 3, *characterised in that* the further section (4, 5) has a contact piece (6, 7) to attach the strand (2) to the battery terminal.

5. The battery terminal connecting cable according to one of Claims 2 to 4, *characterised in that* the further section (4, 5) is made of copper.

6. The battery terminal connecting cable according to one of Claims 2 to 4, *characterised in that* the further section (4, 5) is configured so that its longitudinal extension (22) runs at an angle to the longitudinal axis (23) of the cable (1).

7. A method for the manufacture of a battery terminal connecting cable (1) according to one of the preceding claims in which a strand (2) consisting of numerous fine wires is welded by means of ultrasound.

8. The method according to Claim 7, *characterised in that* the strand (2) is welded to a contact piece or with a contact piece (6, 7).

9. The method according to Claim 8, *characterised in that* the strand (2) is brought flat in contact with the contact piece (6, 7) and then welded with the contact piece (6, 7) under pressure.

10. A device for the manufacture of a battery terminal connecting cable (1) according to one of the preceding claims using a sonotrode (17), a strand feed device, a contact piece feed device and a pressure cylinder (18) arranged so that the strand (2) and the contact piece (7) can be pressed onto each other by this means.

11. The device according to Claim 10, *characterised by* movable jaws which act on the strand (2) at right angles to the axis of the pressure cylinder (18).

ABSTRACT OF THE DISCLOSURE

According to the invention, an at least partially insulated strand of a battery terminal connection cable is either welded to a contact piece using ultrasound or is welded with a contact piece. As a result, the contact piece can be fastened onto the battery terminal using a conventional screw without worrying about the screw becoming loose. The battery terminal connection cable can be produced in an easy and at least partially automated manner using a device which comprises a sonotrode, a strand feed device, a contact piece feed device, and a pressure cylinder.

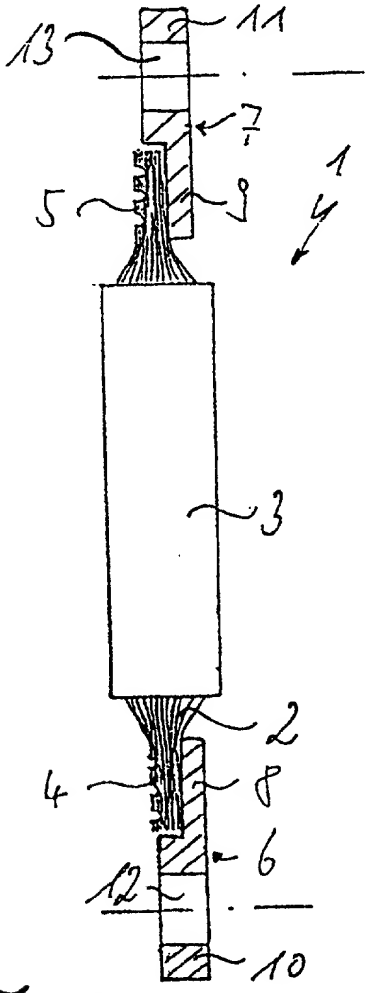

Fig. 1

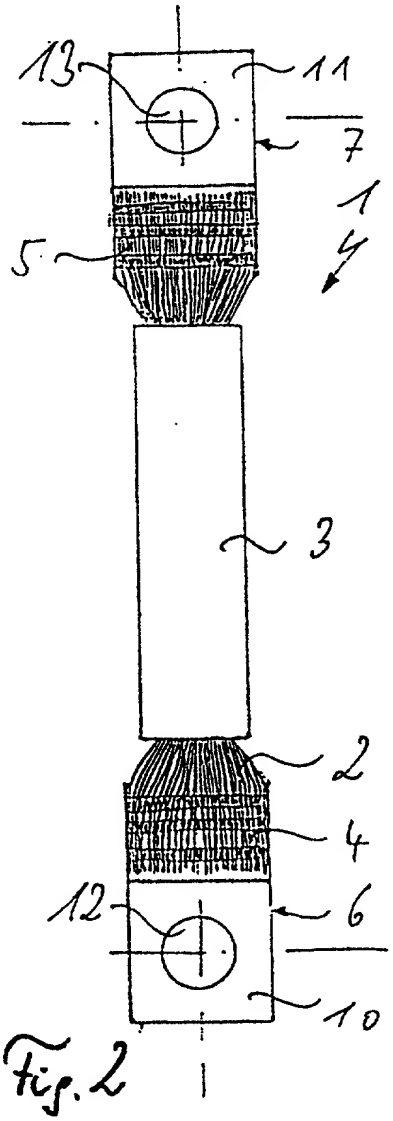

Fig. 2

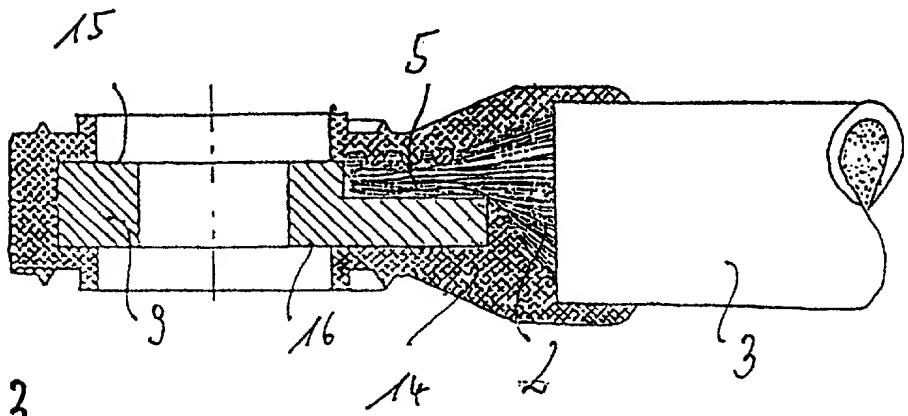

Fig. 3

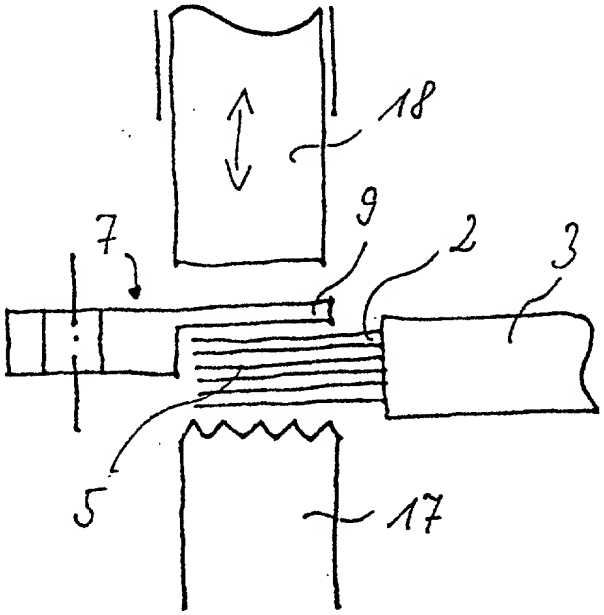

Fig. 4

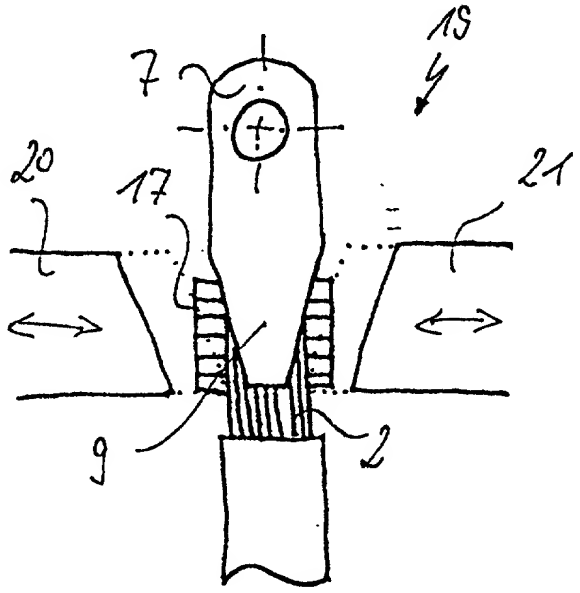

Fig. 5

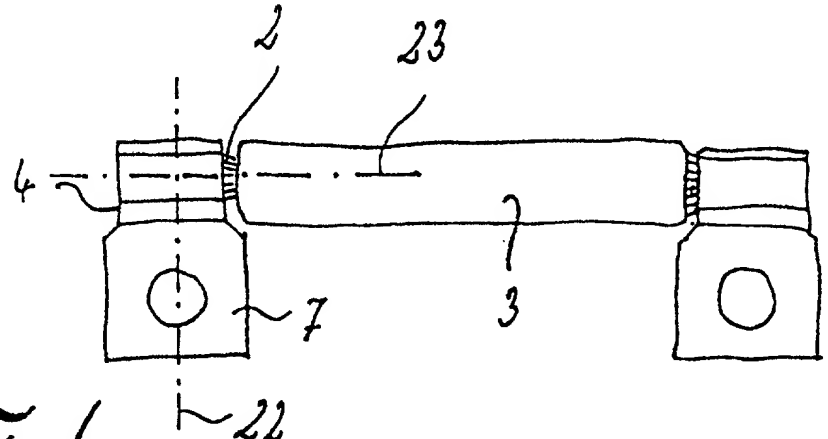

Fig. 6

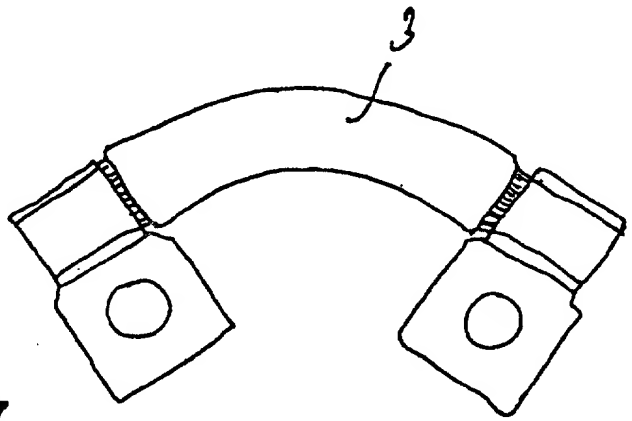

Fig. 7

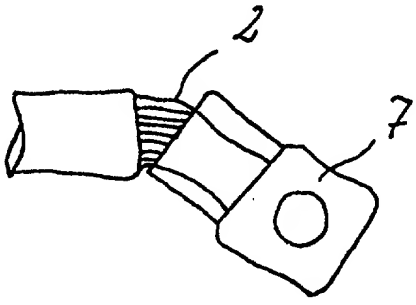

Fig. 8

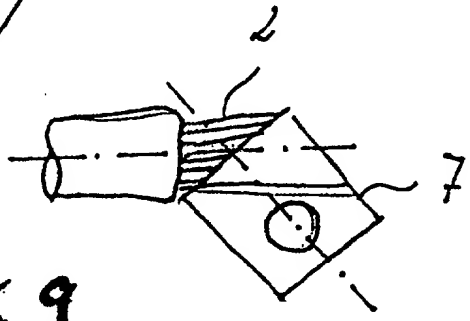

Fig. 9

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY
(Includes Reference to PCT International Applications)

ATTORNEY'S DOCKET NUMBER
WELCKER-1 PCT

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

BATTERY TERMINAL CONNECTION CABLE

the specification of which (check only one item below):

[ ] is attached hereto.

[ ] was filed as United States application

Serial No. _____

on _____,

and was amended

on _____ (if applicable).

[X] was filed as PCT international application

Number PCT/DE99/02323

on 30 JULY 1999,

and was amended under PCT Article 19

on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:

COUNTRY (if PCT, indicate "PCT")	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 USC 119
GERMANY	198 34 792.8	1 AUGUST 1998	[X] YES [ ] NO
GERMANY	199 06 088.6	13 FEBRUARY 1999	[X] YES [ ] NO
			[ ] YES [ ] NO
			[ ] YES [ ] NO

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY
(Includes Reference to PCT International Applications)

ATTORNEY'S DOCKET NUMBER
WELCKER-1 PCT

I hereby claim the benefit under Title 35, United States Code, Section 119(e) of any United States provisional application(s) listed below.

(Application Number) (Filing Date)

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclose in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. 120:

U.S. APPLICATIONS		STATUS (Check One)		
U.S. APPLICATION NUMBER	U.S. FILING DATE	PATENTED	PENDING	ABANDONED

PCT APPLICATIONS DESIGNATING THE U.S.					
PCT APPLICATION NO.	PCT FILING DATE	U.S. SERIAL NUMBERS ASSIGNED (if any)			

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (List name and registration numbers):

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0	RESIDENCE & CITIZENSHIP	CITY HAGEN-HOHENLIMBURG	STATE OR FOREIGN COUNTRY GERMANY DEX	COUNTRY OF CITIZENSHIP GERMANY
1	POST OFFICE ADDRESS	POST OFFICE ADDRESS IM SONNENWINKEL 28	CITY D-58119 HAGEN-HOHENLIMBURG	STATE & ZIP CODE/COUNTRY GERMANY
2	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
0	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
2	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

SIGNATURE OF INVENTOR 201	SIGNATURE OF INVENTOR 202
DATE 26. Jan. 2001	DATE

TOTAL P.03